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US 5311590 A US 4891783 A

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(54) Abstract Title

Protocol for rapidly establishing communication between like terminals

(57) A first terminal capable of communicating under a predetermined protocol and a standard protocol determines whether a second terminal operates under the same predetermined protocol by sending a bit stream which does not violate the standard protocol. Based on the response (or lack of) from the second terminal, the first terminal either determines the same predetermined protocol is used and information ordinarily obtained from negotiations is detected from a prepared table, or otherwise negotiations based on the standard protocol are initiated. The bit stream may contain a unique manufacturer ID and the version of the terminal. The invention avoids the need for relatively lengthy negotiations between terminals of the same manufacturer whilst ensuring compatibility with other types of terminal.

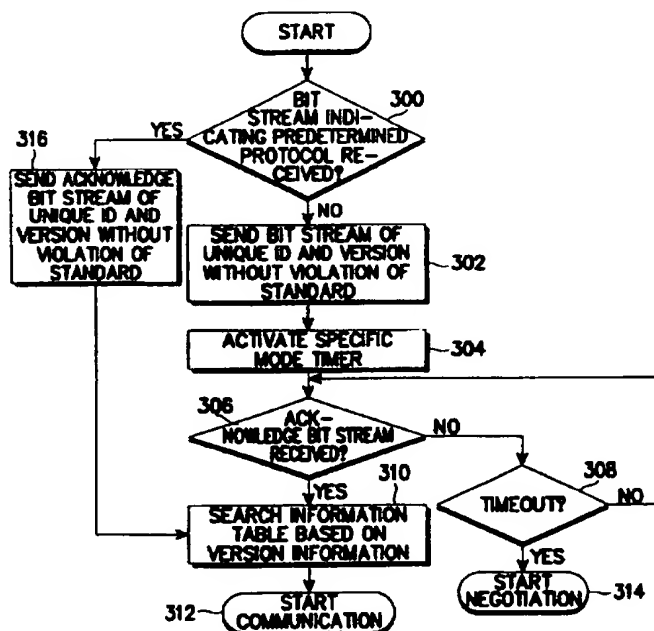


FIG. 3

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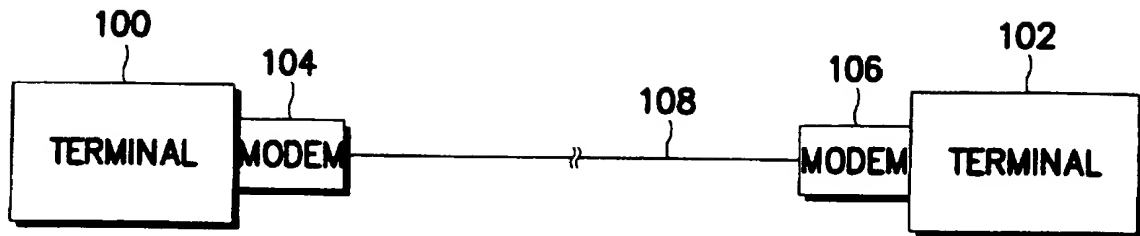


FIG. 1

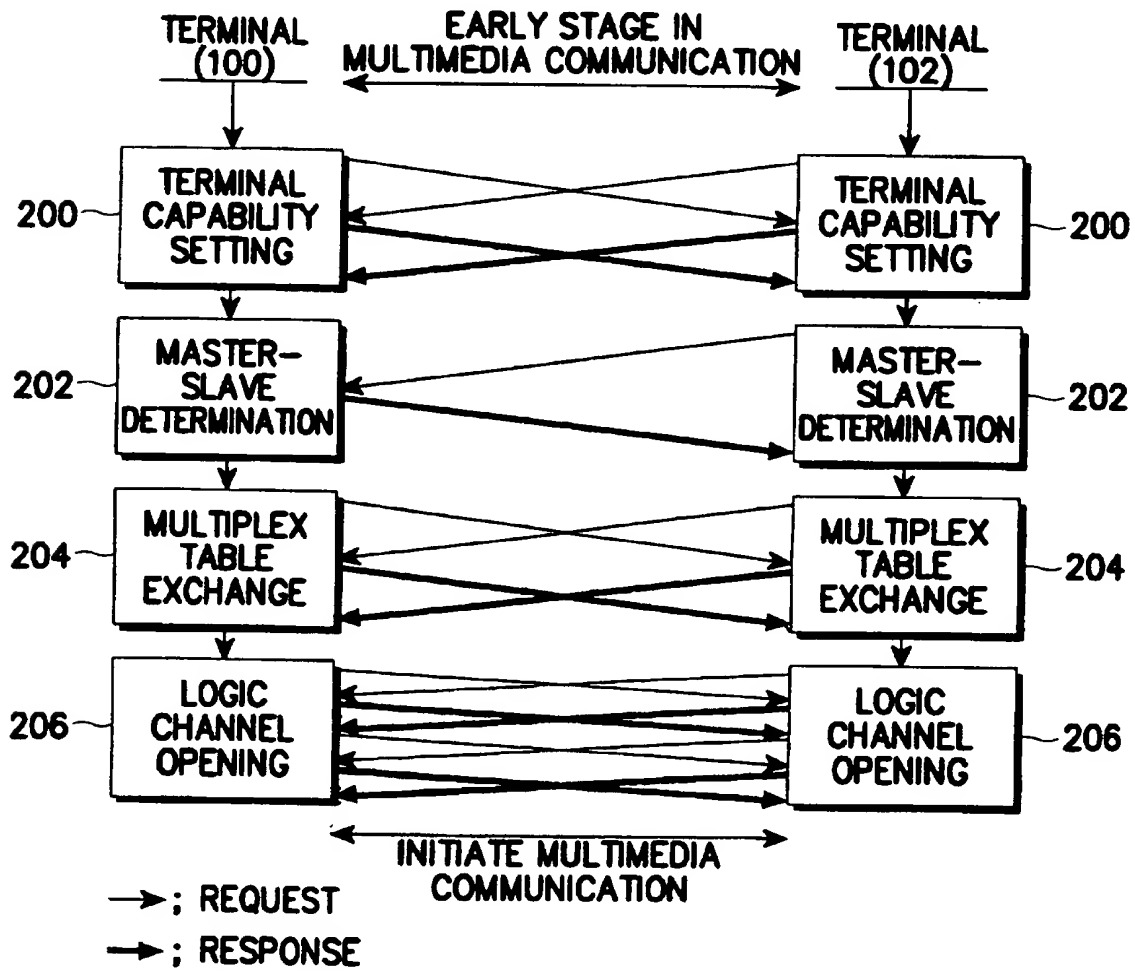


FIG. 2

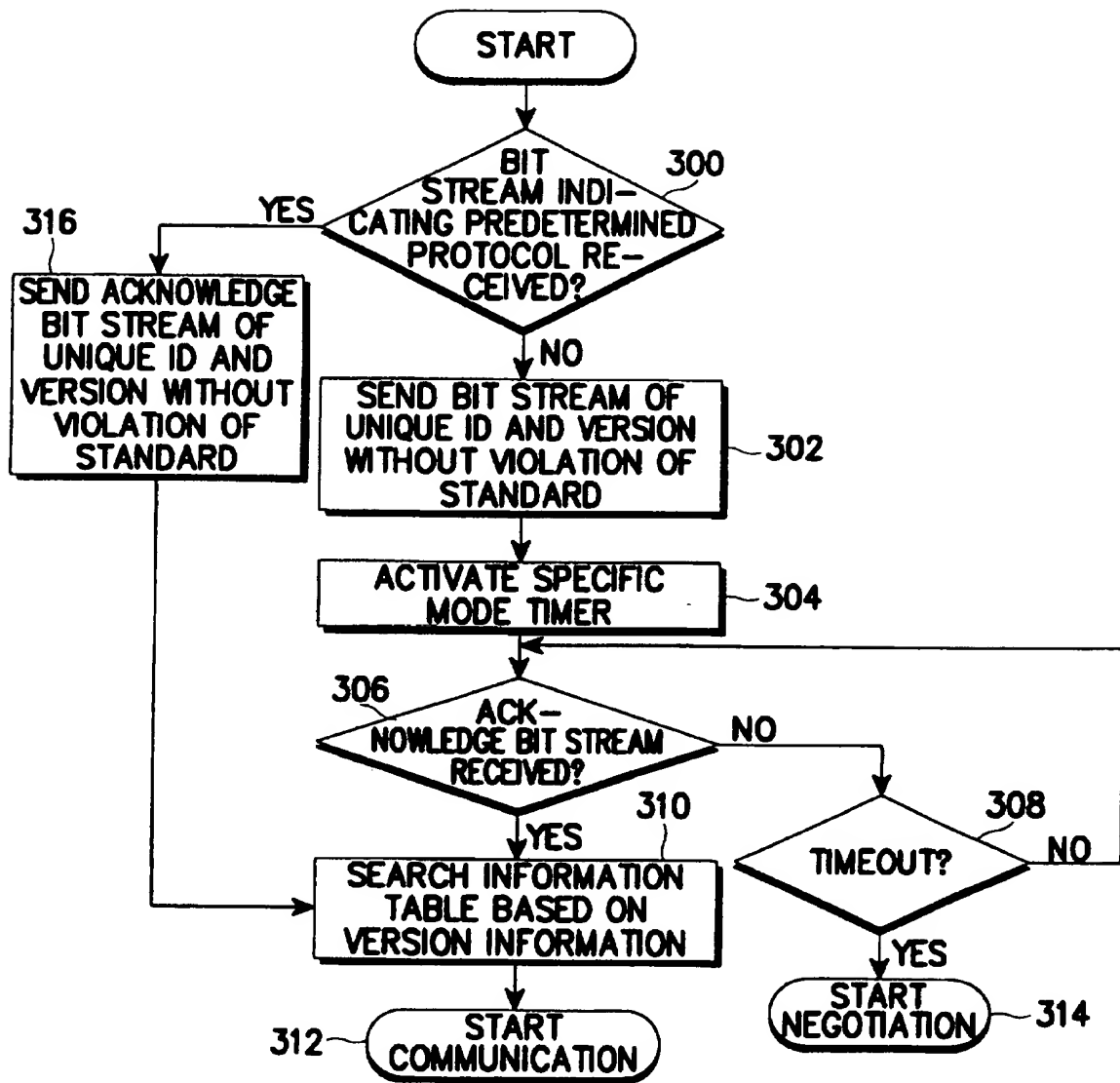


FIG. 3

INTER-TERMINAL COMMUNICATION METHOD

5 The present invention relates to a communication method, and in particular, to an inter-terminal communication protocol method.

10 Many protocols are standardized in view of characteristics inherent to communication. Standard protocols exhibit time inefficiency to some extent because communication in a standard protocol involves a request-response negotiation. However, no compatibility can be ensured between terminals of different manufacturers without conforming to the standard protocol.

15 For multimedia communication between terminals of different companies, they should support a standard protocol, which requires a long negotiation sometimes, due to the communication compatibility provided by the standard protocol. Yet, this causes even users using
20 terminals of the same manufacturer to await until the required negotiation is completed.

25 As described above, since a conventional inter-terminal communication should be performed in conformity with a standard protocol in order to maintain compatibility between terminals of different manufacturers according to the requirement of a negotiation prior to communication, it takes some time for terminals to initiate communication.

30 It is an aim of the present invention, therefore, to provide an inter-terminal communication protocol method for enabling a rapid communication between terminals of an identical manufacturer as well as ensuring compatibility
35 between terminals of different manufacturers.

According to a first aspect of the present invention there is provided an inter-terminal communication method for establishing communication between at least a first terminal and a second terminal, comprising the steps of:

5 (1) causing the first terminal to determine whether the second terminal uses an identical predetermined protocol by sending a bit stream which does not violate a standard protocol before a negotiation of the standard protocol;

10 (2) omitting the negotiation, detecting necessary information, which is supposed to be obtained from the negotiation, from a prepared information table, and starting a communication, if step (1) determines that the terminals use an identical predetermined protocol; and (3)

15 initiating the negotiation if the second terminal does not use the identical predetermined protocol.

Preferably, the determination is made by comparing the manufacturer IDs and versions of the terminals in the step (1), sent in said bit stream.

20

According to a second aspect of the present invention there is provided an inter-terminal communication method comprising the steps of: causing a first terminal to send to a second terminal a bit stream containing manufacturer

25 ID and version information encoded in a predetermined protocol specific to a manufacturer but not to violate a standard protocol, in an early stage before a negotiation based on the standard protocol; causing the first terminal to await an acknowledge bit stream from the second

30 terminal; causing the second terminal to neglect the received bit stream if the second terminal does not use the predetermined protocol, or else causing the second terminal to send to the first terminal an acknowledge bit stream containing manufacturer ID and version information

35 and encoded not to violate the standard protocol, if the

second terminal uses the predetermined protocol; causing the first terminal to omit the negotiation, detect information which is supposed to be obtained from the negotiation from a prepared information table based on the version information, and initiate a communication with the second terminal, upon reception of the acknowledge bit stream from the second terminal during a predetermined waiting period; and causing the first terminal to initiate the negotiation if the first terminal fails to receive the acknowledge bit stream from the second terminal during the predetermined waiting period.

In the preferred method, a first terminal determines whether a second terminal uses a predetermined protocol by sending a bit stream which does not violate a standard protocol, prior to a negotiation of the standard protocol. If the terminals use the same predetermined protocol, the negotiation is omitted, necessary information supposed to be obtained from the negotiation is detected from a prepared information table, and then a communication starts. If the second terminal does not use the identical predetermined protocol, the process of standard negotiation is initiated.

For a better understanding of the invention, and to show how embodiments of the same may be carried into effect, reference will now be made, by way of example, to the accompanying diagrammatic drawings, in which:

Figure 1 is a view of terminals for inter-terminal communication in conformity with a protocol H.245;

Figure 2 illustrates a negotiation procedure in conformity with H.245; and

Figure 3 is a flowchart of implementing a protocol according to an embodiment of the present invention.

5 A preferred embodiment of the present invention will be described in detail with reference to the attached drawings. It is to be appreciated that the present invention is applied, by way of example, to an international standard control protocol H.245 for multimedia communication, for better understanding of the
10 present invention.

Figure 1 is a view illustrating terminals connected to each other for communication in H.245. In Figure 1, two terminals 100 and 102 are connected to each other
15 through their respective modems 104 and 106 mutually connected by a link 108.

In an early stage of an H.245-based multimedia communication, the terminals 100 and 102 are brought into
20 a negotiation as shown in Figure 2. A typical protocol involves a negotiation in which one part notifies the other part of its status and deals with the informed status of the other party. H.245 provides that information needed for multimedia communication is
25 exchanged largely in four steps: terminal capability exchange (step 200), master-slave determination (step 202), multiplex table exchange (step 204), and logical channel establishment (step 206). The terminals cannot conduct a multimedia communication until they are
30 satisfied with a negotiation over these steps. In this way, H.245 allows terminals of different manufacturers to communicate. The protocol is generalized and includes the negotiation of the four steps taking usually about four to eight seconds after modem connection. Users should wait
35 until this negotiation ends.

On the other hand, terminals of an identical manufacturer can initiate a multimedia communication in a shorter time by a predetermined protocol rather than the above standard protocol.

5

Hence, the present invention suggests a novel protocol which conforms to a standard protocol but ensures a remarkably rapid communication. Compatibility in inter-terminal communication can be achieved by implementing a
10 standard protocol for terminals of different manufacturers and a predetermined protocol specific to a manufacturer for terminals of the same manufacturer.

Figure 3 is a flowchart of the protocol according to
15 an embodiment of the present invention.

Prior to a description of the preferred protocol, it should be understood that a terminal sends the other terminal a bit stream which does not violate a standard
20 protocol, in an early stage before initiating the standard protocol. The bit stream is so constituted that even if the other terminal is made by a different manufacturer and cannot interpret the bit stream, the bit stream is simply neglected without sacrificing a normal operation of the
25 standard protocol. This bit stream contains a unique ID assigned to a manufacturer and the version of a terminal.

For example, H.245 generates a bit stream under a packet encoding rule X.691 defined by an encoding syntax
30 ASN.1 of ITU-T (International Telecommunication Union-Telecommunication Standardization Sector). As defined by X.691, any bit stream can be interposed in an extension mark, namely " . . . ". Message definitions in H.245 are shown as follows.

35

Multimedia System Control Message :: = CHOICE

```
{
    request          Request Message,
    response          Response Message,
5    command          Command Message,
    indication        Indication Message,. . .
}
```

Request Message :: = CHOICE

```
{
10    nonstandard          Nonstandard Message,
    master slave determination Mater Slave Determination,
    terminal capability set Terminal Capability Set,
        :
        :
15    round trip delay request Round Trip Delay Request,
    maintenance loop request Maintenance Loop Request
    . . .
}
```

20 The bit stream, for example, the following
information based on ASN.1 is inserted into the extension
mark " . . . ".

Manufacturer Only Message :: = SEQUENCE

```
{
    vendor identifier      OBJECT IDENTIFIER,
25    version              :: = INTEGER (1..65535)
}
```

Manufacturer Only Message Ack :: = SEQUENCE

```
{
    vendor identifier      OBJECT IDENTIFIER,
30    version              :: INTEGER
}
```

where OBJECT IDENTIFIER is the unique ID of a manufacturer
and : : = INTEGER (1..65535) is the version of a terminal.

5 Since the above information is not interpreted in a
terminal of a different manufacturer conforming to a
standard protocol, the X.691-based bit stream can be used
without the concern of affecting a normal operation of the
standard protocol. Thus, a new defined message is

10 Multimedia System Control Message : : = CHOICE
{
 request Request Message,
 response Response Message,
 command Command Message,
15 indication Indication Message,
 ...
 Manufacturer Only Message,
 Manufacturer Only Message Ack,
}

20
 Assuming that "request" is "01 xxx . . .", "response"
is "02 xxx . . .", "command" is "03 xxx . . .", and
"indication" is "04 xxx . . .", "Manufacturer ::" is "05
xxx . . ." and "06 xxx . . .", which is neglected by the
25 other terminal following the standard protocol.

 Terminals of the same manufacturer should have
decoders for interpreting the bit stream. That is, X.691
encoders and X.691 decoders should be set in such a way to
30 send and interpret the bit stream in the terminals 100 and
102. Upon reception of this bit stream, a terminal can
determine whether the other terminal belongs to the same
manufacturer, from the manufacturer ID and version
information. If they are of the same manufacturer, the

other terminal sends a bit stream which does not violate the standard protocol as an acknowledge signal Ack to the terminal. This bit stream also contains the encoded manufacturer ID and version information.

5

Now referring to Figure 3, if both the terminals 100 and 102 are of the same manufacturer using the preferred protocol, a terminal 100 (or 102) determines whether it receives a bit stream representative of a predetermined protocol specific to the manufacturer in step 300, in an early stage before initiating the standard protocol. If the bit stream is not received, the terminal 100 sends the other terminal 102 a bit stream representative of the predetermined protocol, that is, a bit stream containing a manufacturer ID and a version and encoded not to violate the standard protocol, in step 302. In steps 304 to 308, the terminal 100 awaits the acknowledge bit stream Ack from the other terminal 102, for a predetermined time.

20 In step 304, a specific mode timer is activated to check the predetermined timeout period and, in step 306, it is determined whether the acknowledge bit stream Ack is received. If it is not, it is determined whether the predetermined timeout period is expired in step 308. If the timeout period is not expired, the procedure returns to step 306. Then, if the acknowledge bit stream Ack is not received until the expiration of the timeout, the terminals 100 and 102 are brought into a negotiation as provided in the standard protocol, in step 314. If the other terminal 102 does not use the predetermined protocol, the terminal 102 neglects the bit stream and the negotiation starts. On the contrary, if the acknowledge bit stream Ack is received before the timeout period is expired, the negotiation is omitted and information, which might otherwise be obtained from the negotiation, is

detected from an information table prepared by the manufacturer in connection with the version information, in step 310. Then, a communication starts in step 312.

5 Meanwhile, if the terminal 100 receives the bit stream representative of the predetermined protocol from the other terminal 102 in step 300, the terminal 100 sends the other terminal 102 the acknowledge bit stream Ack having the manufacturer ID and version information encoded
10 not to violate the standard protocol, in step 316. Then, the negotiation is omitted and the necessary information is obtained from the information table, in step 310, and a communication starts in step 312.

15 In the protocol described above, terminals of the same manufacturer can conduct a more rapid communication, as compared to a terminal supporting a standard protocol only, because the negotiation procedure in an early stage of the standard protocol can be finished just with one
20 request and one acknowledgement. A standby time in an early stage of multimedia communication is reduced from about four to eight seconds in the standard protocol only-based terminal to about one second in the preferred embodiment. Further, the standard protocol is still
25 supported, providing cross-manufacturer compatibility in inter-terminal communication.

 In conclusion, the described invention offers the advantages of a remarkably rapid multimedia communication
30 for terminals of the same manufacturer with cross-manufacturer compatibility maintained.

 While the present invention has been described in detail with reference to the specific embodiment, it is a
35 mere exemplary application. In particular, the present

invention is applicable to H.324, H.323, and the like as well as H.245 which has been exemplarily described in the embodiment. Thus, it is to be clearly understood that many variations can be made by anyone skilled in the art within the scope of the present invention.

The reader's attention is directed to all papers and documents which are filed concurrently with or previous to this specification in connection with this application and which are open to public inspection with this specification, and the contents of all such papers and documents are incorporated herein by reference.

All of the features disclosed in this specification (including any accompanying claims, abstract and drawings), and/or all of the steps of any method or process so disclosed, may be combined in any combination, except combinations where at least some of such features and/or steps are mutually exclusive.

Each feature disclosed in this specification (including any accompanying claims, abstract and drawings), may be replaced by alternative features serving the same, equivalent or similar purpose, unless expressly stated otherwise. Thus, unless expressly stated otherwise, each feature disclosed is one example only of a generic series of equivalent or similar features.

The invention is not restricted to the details of the foregoing embodiment(s). The invention extends to any novel one, or any novel combination, of the features disclosed in this specification (including any accompanying claims, abstract and drawings), or to any novel one, or any novel combination, of the steps of any method or process so disclosed.

CLAIMS

1. An inter-terminal communication method for establishing communication between at least a first
5 terminal and a second terminal, comprising the steps of:

(1) causing the first terminal to determine whether the second terminal uses an identical predetermined protocol by sending a bit stream which does not violate a
10 standard protocol before a negotiation of the standard protocol;

(2) omitting the negotiation, detecting necessary information, which is supposed to be obtained from the
15 negotiation, from a prepared information table, and starting a communication, if step (1) determines that the terminals use an identical predetermined protocol; and

(3) initiating the negotiation if the second terminal
20 does not use the identical predetermined protocol.

2. The inter-terminal communication method of claim 1, wherein the determination is made by comparing the manufacturer IDs and versions of the terminals in the step
25 (1), sent in said bit stream.

3. An inter-terminal communication method comprising the steps of:

30 causing a first terminal to send to a second terminal a bit stream containing manufacturer ID and version information encoded in a predetermined protocol specific to a manufacturer but not to violate a standard protocol, in an early stage before a negotiation based on the
35 standard protocol;

causing the first terminal to await an acknowledge bit stream from the second terminal;

5 causing the second terminal to neglect the received bit stream if the second terminal does not use the predetermined protocol, or else causing the second terminal to send to the first terminal an acknowledge bit stream containing manufacturer ID and version information and encoded not to violate the standard protocol, if the
10 second terminal uses the predetermined protocol;

causing the first terminal to omit the negotiation, detect information which is supposed to be obtained from the negotiation from a prepared information table based on
15 the version information, and initiate a communication with the second terminal, upon reception of the acknowledge bit stream from the second terminal during a predetermined waiting period; and

20 causing the first terminal to initiate the negotiation if the first terminal fails to receive the acknowledge bit stream from the second terminal during the predetermined waiting period.

25 4. An inter-terminal communication method substantially as hereinbefore described with reference to Figure 3 of the accompanying drawings.

30 5. A terminal arranged to perform an inter-terminal communication method as claimed in any of claims 1 to 4.



Application No: GB 9905982.6
Claims searched: 1-5

Examiner: Matthew Nelson
Date of search: 21 September 1999

Patents Act 1977
Search Report under Section 17

Databases searched:

UK Patent Office collections, including GB, EP, WO & US patent specifications, in:

UK Cl (Ed.Q): H4P (PPEC)

Int Cl (Ed.6): H04L 5/14, 29/06

Other: Online: WPI, EPODOC, JAPIO

Documents considered to be relevant:

Category	Identity of document and relevant passage	Relevant to claims
A	EP 0695069 A2 (SHARP) See abstract	
A	EP 0364866 A2 (HAYES) See e.g. p. 7, line 36 - p. 8, line 11	
A	US 5311590 (ARNOLD & HOYLER) See whole document	
A	US 4891783 (ARITAKA & KOMAKI) See abstract	
A	JP 050056101 A (MATSUSHITA) See JAPIO online abstract	

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X	Document indicating lack of novelty or inventive step	A	Document indicating technological background and/or state of the art.
Y	Document indicating lack of inventive step if combined with one or more other documents of same category.	P	Document published on or after the declared priority date but before the filing date of this invention.
&	Member of the same patent family	E	Patent document published on or after, but with priority date earlier than, the filing date of this application.